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ABSTRACT

Teacher Web sites offer a means of establishing better communication between parent and teacher. We describe an example of a strategy we have found to be successful for a high school chemistry teacher. The Web site was available to parents and students using a dynamic database and provided a day-by-day lesson schedule, homework assignments, due dates, general course information, and help links. An analysis of site use for the 1998-99 school year reveals interesting patterns, and invites suggestions for others considering using Web pages with high school courses. (Author)

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A Descriptive Analysis of a Chemistry Teacher's Web site

Kent J. Crippen*
University of Nevada Las Vegas
kcrippen@unlv.edu

Kent Crippen is currently a Assistant Professor of Science Education and Technology at the University of Nevada Las Vegas. Before coming to UNLV, Kent taught high school chemistry and has a strong interest in the application of technology in science instruction.

David W. Brooks
University of Nebraska – Lincoln
dbrooks1@unl.edu

Corresponding author

David Brooks is Professor of Chemistry Education at the University of Nebraska - Lincoln. He teaches about classroom uses of technology, and focuses his research on technology in teaching, especially in chemistry teaching.

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A Descriptive Analysis of a Chemistry Teacher's Web site

-Abstract-

Teacher Web sites offer a means of establishing better communication between parent and teacher. We describe an example of a strategy we have found to be successful for a high school chemistry teacher. The Web site was available to parents and students using a dynamic database and provided a day-by-day lesson schedule, homework assignments, due dates, general course information, and help links. An analysis of site use for the 1998-99 school year reveals interesting patterns, and invites suggestions for others considering using Web pages with high school courses.

Key Words: authoring tools and methods, computer-mediated communication, improving classroom teaching, secondary education, teaching/learning strategies.

INTRODUCTION

We began using World Wide Web (WWW) sites as a means of presenting and gathering student information in 1997. Posting information on the Web keeps parents, students, and colleagues aware of happenings in a teacher's classroom. In our hands, the WWW is proving to be an effective, efficient, and non-threatening mode of communication for parents and teachers.

Our experience in providing student/parent Web pages has evolved. We began by using a text editor to create Web pages, and graduated to an 'HTML page editor'. Today we use database software (*Filemaker Pro*®) in conjunction with a page editor (*HomePage*®) to create pages. These two products work together to allow the Web publisher to create dynamic Web sites. The content of the Web site makes it popular with students, parents, and colleagues.

The teaching described took place in chemistry and 'gifted' chemistry classes at a traditional Midwest high school located in a city of 213,000 people. The school's enrollment of 2,250 students comes from middle to upper-middle class backgrounds. The Web site (Crippen, 1999) was provided to parents of 125 students from five classes and contained information appropriate for parents and students in these courses. Visitors to the site found a day-by-day lesson schedule, homework assignments, due dates, general course information, and help links. We tracked the use of this site throughout the 1998-99 academic year. Here we report an analysis of the site that reveals interesting patterns, and invites suggestions for others considering using Web pages with high school courses.

REVIEW OF THE LITERATURE

Research suggests that involving parents with school activities is an effective and appropriate strategy for enhancing student performance (Pressley, 1995; Walberg, 1995). While schools are obligated to communicate with parents concerning school programs and student progress (Chapman, 1991), school schedules often conflict with parent work schedules.

At the heart of establishing and nurturing an effective relationship between parents and teachers is good communication. Research suggests that parents who are involved in their students' education have better attendance and have greater academic achievement (Sattes, 1989). Yet communication between parent and teacher is problematic due to many factors, which include schedule conflicts, personality differences, and levels of comfort. Technology and the WWW can be useful tools in enhancing parental involvement through communications that can serve as a cornerstone to improving student academic performance.

Establishing e-mail communications with parents -- individually – increases the likelihood for an increase in the total amount of time spent responding to parental e-mail. If one takes a Web-based approach to communication with parents, one controls total time more effectively. Skeptics will suggest that a WWW approach is impersonal. In fact, early experience suggests that parents take this approach in just the opposite way -- that is, they are likely to think that the teacher is spending more individual time with them, not less!

Teacher Web sites offer a means to establishing better communication between parent and teacher. Our Web site serves as one example of a strategy we have found to be successful for a high school chemistry teacher. The literature also reveals examples and suggestions for many types of teacher Web sites, from special education teachers (Whorton, 1998) to college professors interested in an electronic syllabus (Bull, 1998).

METHODS

Our site content was created dynamically from a database. Once the database was constructed and serving to the Web, the teacher was afforded the luxury of lesson planning within a Web browser. In addition, the lesson database was linked to a help database, which allowed users (teachers, students, parents, etc.) to submit URLs for any sites on the WWW that they thought were helpful.

The information at our site was stored in and served to the WWW via a Filemaker Pro® database. Using HomePage® in conjunction with Filemaker Pro® facilitated the creation of 'shell' Web pages in which the actual contents were created in a dynamic fashion. These HTML documents were created using HomePage® and its 'Connection Assistant' utility that seamlessly created CDML (Claris Dynamic Markup Language) tags for use with Filemaker Pro®. The dynamic nature of the database format allowed the teacher to spend less time on 'Web details', and more time on site content. Today all of the teacher's scheduling information is entered into a database over the WWW -- and the software automatically encodes those entries for WWW presentation.

This Web site was available year around and its content was updated regularly. Teacher planning typically was accomplished on a unit-by-unit basis with each unit lasting from three to four weeks. Therefore, accessing the lesson database allowed a user to see lessons from the start of the semester, and to see them for some time into the future. The regular classroom schedule included weekly homework assignments (due Thursday) and a biweekly quiz (Friday).

The Web site was first announced to students in the course syllabus, and the teacher made it a point to highlight the advantages of using the Web site as a reference tool. Students were informed that their parents would be made aware of the site and encouraged to use it to help them in the course. All correspondence with students and parents, including e-mail, traditional notes, grade reports, and even telephone conversations included the URL and reference to the Web site.

RESULTS

Following the academic school year, the Web server's activity log was analyzed. The log recorded information for each request from the database. Each request produced data pertaining to the user, time, date, and IP address. Because the teacher accessed the database from his classroom using a computer with a static IP address, teacher database requests were removed from the data set.

The teacher tended to access the database in single sittings for lesson planning. The online database allowed the teacher to plan in sessions of varying amounts of time. The teacher quickly could sit down and add any special school days or new calendar events (i.e. club days, pep rally's). The teacher also could plan an entire unit of instruction. Having the database available via a Web browser proved to be a very handy teacher tool. When planning, the teacher could have all of their materials available and type into a screen layout that modeled the chronological nature of instruction. Answering a student question about missing assignments was accomplished from any location in the building with a computer connected to the Internet. Over the term, the teacher abandoned all other forms of formal lesson plans (electronic or notebook) and used the web database as the only record of events for the school year. Following the school year, the database was copied and filed for convenient future reference.

The Web site logged 1,166 requests over a 274-day period, which represents the academic year 1998-99 (Table 1), an average of 4.3 pages served per day (Figure 1). Removing weekends, breaks, and vacations from the total number of day's increases the average to 7.1 hits per school day. The maximum number of hits on any single day (n=34) occurred on Thursday September 3, 1998, two days after the Open House meeting where this site was first announced to parents.

Peak use occurred between 4:00 p.m. and 10 p.m. (Figure 2). Interestingly, the site was used *during* the day. IP address data suggests that users accessed the site from within the local school district. These addressees were associated with a number of buildings, including an elementary school and all four of the district's high schools.

Mondays and Thursdays were peak days for use during the week (Figure 3). However, weekend days and non-school days (e.g. spring break) did see activity.

Converting IP addresses to domain information reveals an interesting pattern (Figure 4). In addition to school district computers and contacts with local and regional Internet Service Providers (ISPs), a number of page requests were processed for computers outside of Nebraska.

Peak dates of activity were cross-referenced to the lesson agenda for both courses as well as the school agenda (Table 2). The peak dates noted were those recording two standard deviations above the mean number of hits per day (n=15). The peak dates for Web site activity can be broadly classified into three main groups:

1. date preceding a formal assessment in the course, i.e. a quiz, test or lab report
2. date preceding a formal grade report from the school to parents
3. date following formal contact with parents, i.e. a conference or meeting

Although no formal survey data was recorded, informal conversations with students suggest that they found the site a great convenience. They comment that they used the site from school and from home. The Web server's log was consistent with these comments. Comments at parent-teacher conferences and e-mail exchanges between teacher and parents suggest that parents found the Web site helpful, especially when their students were behind, or had been absent and needed to make up work. The Web site seemed to facilitate e-mail exchanges between parents and teachers. Site content gave parents and teachers a common frame of reference.

DISCUSSION

The Web site was intended to provide interested parties with the most current information about the daily occurrences of chemistry classes as well as handy access to help resources. The goal of a Web site of this nature is that parents as well as students will use it and that either user will have access to information they want, at their leisure.

A 'typical' site user is someone from a local ISP who is interested in the content of this site as it pertains to success in the course. The user is browsing the site between 4:00 p.m. and 10 p.m. on a weekday, and uses the site consistently. The consistency of use suggests the available content was in line with users' needs.

While the site provided access to current information, the site also afforded students and parents the option to look back in time at events. Students making up absences found this aspect very useful. The teacher referred absent students to the Web site upon return to class. Many students returned with printed copies of lesson plans from missed days. These plans were obtained using home computers.

The URL for this site was first announced at the annual Open House, an informal meeting between teachers and parents where parents have the opportunity to learn about their children's classes and teachers. Open House attendance usually is very high, and the initial reaction from the parents in attendance was overwhelmingly positive. Many parents commented that teacher Web sites are a wonderful use of technology, and indicate that they would be "looking in" on a regular basis as the school year progressed.

It is impossible to assert with any empirical certainty the effectiveness of Web communications for teachers and parents or the role of the Web site in the academic performance of students. Yet, our experiences with this site and conversations with parents and students suggest that using the WWW to provide information influences student performance in the classroom. Our Web sites count hundreds of 'hits' per semester, student's comment that they are better prepared, and parents suggest that they have the option to 'follow along' with their children and add assistance where they see fit. While the Web is a relatively new phenomenon, and we are only beginning to understand the effectiveness of this communication medium, we are quite pleased and encouraged by our initial results.

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Table 1

Statistical summary of use for the teacher lesson plan Web site.

Total hits	1166
Total days	274
Total hits/day	4.3 *Mean*
	3 *Median*
	0 *Mode*
	5.3 *SD*
Total school days	165
Total hits/school day	7.1
Maximum 'hits'	34.0
Date	9/3/98
IP addresses inside the school district domain	198
Percent of IP addresses inside the district domain	17%
IP addresses outside the school district domain	986
Percent of IP addresses outside the district domain	83%

Table 2

Lesson plans during peak server activity.

Date	Server Hits	Day of Week	Regular Chemistry Functions	Gifted Chemistry Functions	School/District Functions
9/3/98	34	Thursday	First quiz on following day	First quiz on following day	9/1/98 was Open House
9/13/98	22	Sunday	First Unit test on following Thursday	First Unit test on following Thursday	
10/11/98	19	Sunday	Lab Report Due Monday	Normal week, no Friday Quiz	10/7 /98 was Parent-Teacher Conference
10/14/98	15	Wednesday	Day before homework is due	Day before homework is due	Day after Parent-Teacher Conference
10/20/98	23	Tuesday	Extra credit due on following day	Lab report due on following day	No school Thursday or Friday, End of 1st. Quarter
11/3/98	17	Tuesday	Normal week with Friday Quiz	Unit test on Following day	
11/10/98	19	Tuesday	Unit Test Today	Lab report due, homework Due on Wednesday	
2/15/99	22	Monday	No School Today	No School Today, projects due Friday	
2/20/99	18	Saturday	Normal week with Friday Quiz	Unit test on Wednesday of following week	Mid quarter reports due Wednesday
2/28/99	16	Sunday	Unit Test on Wednesday	Normal week, no Friday Quiz	
3/29/99	21	Monday	Normal week, No School Thursday or Friday	Normal week, No School Thursday or Friday	First week of 4th. Quarter
5/3/99	23	Monday	Lab Quiz Today	Normal week, no Friday Quiz	Mid quarter reports due today
5/6/99	19	Thursday	Normal week, no Friday Quiz	Normal week, no Friday Quiz	
5/24/99	16	Monday	Final exam review on Friday	Lab report due Tues., Quiz Fri.	Last week of classes before final exams

FIGURE CAPTIONS

Figure 1.

Average page request per hour of the day for the academic term 1998-99.

Figure 2.

Page requests per day for the academic term 1998-99.

Figure 3.

Average page request by day of the week for the academic term 1998-99.

Figure 4.

Average page request by domain for the academic term 1998-99.

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